Applicant: Pekka Koivukunnas et al.
Application No.: 10/069,203
Response to the Office action dated Feb. 2, 2004

Claim Listing

1–6. (cancelled)

7. (previously presented) A method for surface treatment of a paper and/or board web in a paper or board machine including a yankee cylinder having a smooth surface followed by a calendering unit, comprising the steps of:

pressing a paper or board web with a moisture of 50% to 80% with a press roll on to the smooth surface of the yankee cylinder;

drying and glazing the web on the smooth surface of the yankee cylinder, the paper or board web forming a gloss surface in contact with the smooth surface of the yankee cylinder;

separating the paper or board web from the yankee cylinder with a doctor device;

following separating with the doctor device, guiding the paper or board web immediately into a shoe calender unit having a shoe press within a flexible mantle, and forming a nip with a roll having a rigid mantle made of metal, wherein the gloss surface of the paper or board web is further glazed in contact with the rigid mantle made of metal.

8. (currently amended) The method of claim 7 further comprising the step of increasing the ~~wherein when it is intended to achieve a given paper or board quality, the difference between the running speed used and the maximum~~ running speed ~~dependent on the evaporation capacity~~ of the yankee cylinder and compensating for the loss of gloss and smoothness of the paper or board resulting from the increased running speed by the ~~is compensated for by means of calendering, the~~ calendering after the yankee cylinder ~~enabling the running speed of the yankee cylinder to be increased without the quality in the form of the gloss and smoothness of the paper or board suffering~~.

9. (canceled)

10. (currently amended) An arrangement for surface treatment of paper and/or board in a paper or board machine including a yankee cylinder followed by a calendering unit comprising:

a paper or board web with a moisture of 50% to 80% wrapped on to a yankee cylinder having a smooth drying surface, so that a first surface of the paper or board web is engaged with the smooth drying surface of the yankee cylinder;

following the yankee cylinder the paper or board web extends to ~~is engaged with~~ a doctor device and then further extends to a calendering unit, which is formed by a shoe calender unit having a shoe press within a flexible mantle, and forming a nip with a roll having a rigid mantle made of metal, wherein the first surface of the paper or board web is further ~~glazed~~ in glazing contact with the rigid mantle made of metal.

11–13. (canceled)

14. (previously presented) A method for surface treatment of a paper and/or board web in a paper or board machine comprising the steps of:

pressing a paper or board web with a moisture of 50% to 80% with a press roll on to the smooth surface of a yankee cylinder;

drying and glazing the web on the smooth surface of the yankee cylinder, the paper or board web forming a gloss surface in contact with the smooth surface of the yankee cylinder;

running the yankee cylinder at a first running speed which is the maximum speed to obtain a given quality of web gloss and smoothness;

increasing the running speed of the yankee cylinder beyond the first running speed to produce a web having a quality of web gloss and smoothness which is below the given quality;

separating the paper or board web from the yankee cylinder with a doctor device;

following separating with the doctor device, guiding the paper or board web immediately into a shoe calender unit having a shoe press within a flexible mantle, and forming a nip with a roll having a rigid mantle made of metal, wherein the gloss surface of the paper or board web is further glazed in contact with the rigid mantle made of metal to impart the given quality of web gloss and smoothness to the web.

15. (currently amended) A method for surface treatment of a paper and/or board web in a paper or board machine including a yankee cylinder having a smooth surface followed by a calendering unit, comprising the steps of:

pressing a paper or board web with a moisture of 50% to 80% with a press roll on to the smooth surface of the yankee cylinder;

drying and glazing the web on the smooth surface of the yankee cylinder, the paper or board web forming a gloss surface in contact with the smooth surface of the yankee cylinder;

separating the paper or board web from the yankee cylinder with a doctor device; and

following separating with the doctor device guiding the paper or board web immediately into a belt ~~technology~~ calender unit having a roll within a flexible mantle and forming a nip with a roll having a rigid mantle made of metal, wherein the gloss surface of the paper or board web is further glazed in contact with the rigid mantle made of metal.

16. (currently amended) The method of claim 15 further comprising the step of increasing the ~~wherein when it is intended to achieve a given paper or board quality, the difference between the running speed used and the maximum~~ running speed ~~dependent on the evaporation capacity~~ of the yankee cylinder and compensating for the loss of gloss and smoothness of the paper or board resulting from the increased running speed by the ~~is compensated for by means of calendering, the~~ calendering after the yankee cylinder ~~enabling the running speed of the yankee cylinder to be increased without the quality in the form of the gloss and smoothness of the paper or board suffering~~.

17. (currently amended) An arrangement for surface treatment of paper and/or board in a paper or board machine including a yankee cylinder followed by a calendering unit comprising:

a paper or board web with a moisture of 50% to 80% wrapped on to a yankee cylinder having a smooth drying surface, so that a first surface of the paper or board web is engaged with the smooth drying surface of the yankee cylinder;

following the yankee cylinder the paper or board web extends to ~~is engaged with~~ a doctor device [[and]] and following the doctor device the paper or board web extends through a belt ~~technology~~ calender unit, the belt ~~technology~~ calender unit having a roll within a flexible mantle and forming a nip with a roll having a rigid mantle made of metal, wherein the first surface of the paper or board web is in contact with the rigid mantle made of metal.

18. (currently amended) A method for surface treatment of a paper and/or board web in a paper or board machine comprising the steps of:

pressing a paper or board web with a moisture of 50% to 80% with a press roll on to the smooth surface of a yankee cylinder;

drying and glazing the web on the smooth surface of the yankee cylinder, the paper or board web forming a gloss surface in contact with the smooth surface of the yankee cylinder;

running the yankee cylinder at a first running speed which is the maximum speed to obtain a given quality of web gloss and smoothness;

increasing the running speed of the yankee cylinder beyond the first running speed to produce a web having a quality of web gloss and smoothness which is below the given quality;

separating the paper or board web from the yankee cylinder with a doctor device; and

following separating with the doctor device, guiding the paper or board web immediately into a belt ~~technology~~ calender unit having a roll within a flexible mantle and forming a nip with a roll having a rigid mantle made of metal, wherein the gloss surface of the paper or board web is further glazed in contact with the rigid mantle made of metal to impart the given quality of web gloss and smoothness to the web.

19. (previously presented) The method of claim 7 wherein the nip pressure is at least 200 kN/m and the Hunter gloss of the gloss surface is at least 30% after the shoe calender unit.

20. (previously presented) The method of claim 14 wherein the nip pressure is at least 200 kN/m and the Hunter gloss of the gloss surface is at least 30% after the shoe calender unit.